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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/706,929

11/14/2003

Kazutaka Hattori

117151

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02/27/2007

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EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1753

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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3 MONTHS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/706,929 | Applicant(s) HATTORI, KAZUTAKA | |
| | Examiner Kaj K. Olsen | Art Unit 1753 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7, 8, 13, 14, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) 3-6, 9-12, 15-18 and 21-24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11-14-2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention should have the “and method” deleted in view of the fact that claims 25-48 have been canceled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 7, 8, 13, 14, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al (USP 6,649,041) in view of Hasegawa et al (USP 6,258,232).
4. Hashimoto discloses a degradation detection apparatus for an oxygen sensor that comprises a first judgement value acquirer 110 that calculates an element impedance real value from a power (i.e. voltage ES) that was applied to the oxygen sensor. See col. 6, ll. 29-45 and col. 7, ll. 57-61. Hashimoto further discloses a second judgment acquirer 111, which calculates a heater resistance. This measured heater resistance would read on the defined factor that affects a temperature of the oxygen sensor, giving the claim language its broadest reasonable interpretation, because the heater clearly contributes to the temperature of the sensor. Hashimoto further discloses an abnormality determiner based on the first and second judgment values. See

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col. 7, l. 58 through col. 8, l. 14. Hashimoto does not explicitly disclose that the second judgment value is an element temperature estimated value. However, it is well known in the art that the heater resistance of a sensor can be related back to an estimated temperature of the heater. This is shown by Hasegawa, which showed that heater resistance and heater temperature are linearly related. See fig. 28. Moreover, Hasegawa recognized that one can utilize either the heater resistance or the calculated (i.e. estimated) heater temperature as a representation of the heater because heater resistance and temperature are equivalent to each other in sensor operational schemes. See fig. 23D and 23E and col. 18, ll. 3-7. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Hasegawa for the apparatus of Hashimoto because heater resistance and heater temperature were recognized in the art as being equivalent to each other and the substitution of one for the other would have required only routine skill in the art.

5. With respect to the abnormality determiner determining if a relationship between the first and second judgment values agrees with normal temperature characteristic, Hashimoto already recognized that the resistances being compared were related to the temperature dependencies for the sensor and heater. See col. 2, ll. 8-12. Hence, the comparison of Hashimoto is inherently determining whether the values agree with normal temperature characteristics.

6. With respect to the claims where the first judgment value is an "element temperature theoretical value", Hasegawa also recognized that the impedance value Z_{ac} (equivalent to the R_s of Hashimoto) could also be converted into a theoretical temperature that corresponds to that impedance as well. See fig. 17 and col. 10, ll. 47-53. In fact, Hasegawa teaches in the embodiment of fig. 27 converting both of the heater and sensor resistances (equivalent to R_h and

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Rs of Hashimoto) into estimated temperature representations for gas sensor control. See col. 17, l. 60 through col. 18, l. 7.

Allowable Subject Matter

7. Claims 3-6, 9-12, 15-18, and 21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 3, 9, 15, and 21, the prior art does not disclose nor render obvious all the limitations that preceded these claims and further comprising a heater electrification state detector that detects a state of electrification of the heater and a sensor element abnormality identifier that, if it is determined that the oxygen sensor has an abnormality in a situation where the heater is not electrified, identifies the abnormality of the sensor element. Claims 4, 5, 10, 11, 16, 17, 22, and 23 contain allowable subject matter in view of their dependence from claims 3, 9, 15, and 21. With respect to claims 6, 12, 18 and 24, the prior art does not disclose nor render obvious where the abnormality determiner comprises a first change amount detector that detects an amount of change in the first judgment value and a second change amount detector that detects an amount of change in the second judgment value and where the abnormality detector determines the abnormality if the amount of change in the first and second judgment values do not exhibit a normal correlation.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753
February 22, 2007


KAJ K. OLSEN
PRIMARY EXAMINER